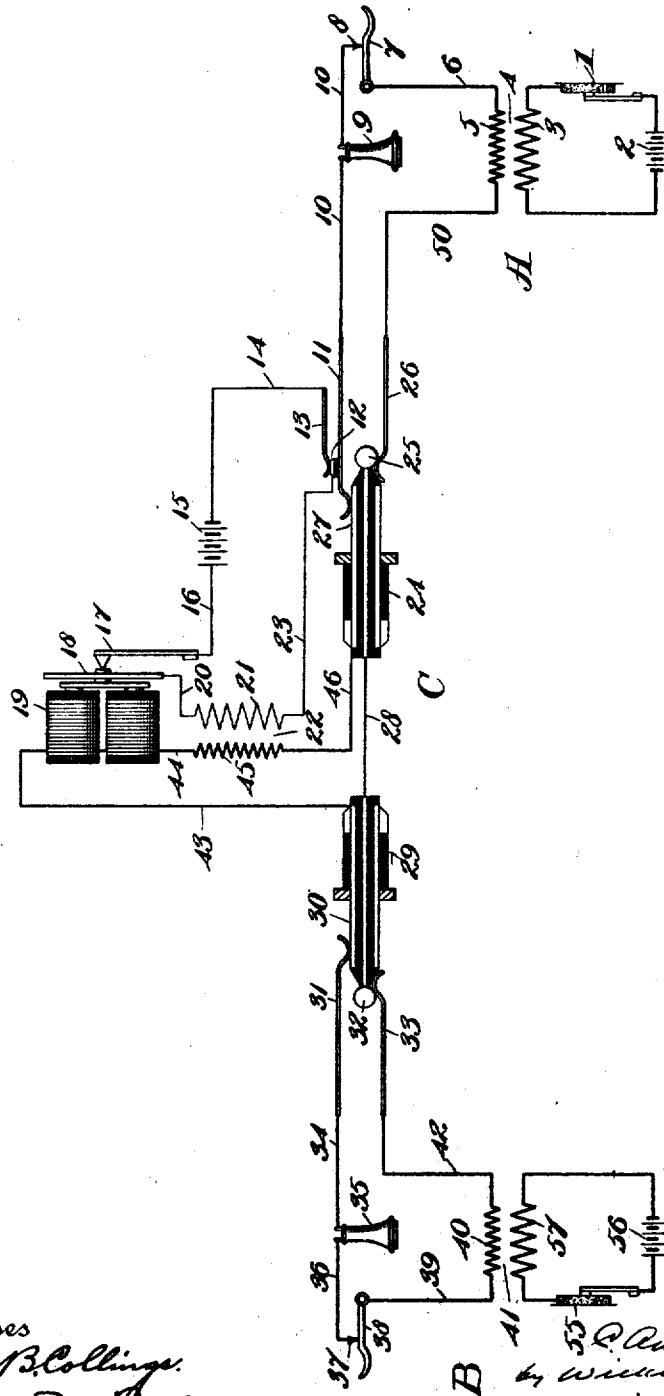


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TELEPHONE CIRCUIT AND REPEATING APPARATUS
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1,015,769.

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Witnesses
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UNITED STATES PATENT OFFICE.

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TELEPHONE CIRCUIT AND REPEATING APPARATUS.

1,015,769.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES ADAMS-RANDALL, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Telephone Circuits and Repeating Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to telephone circuits and repeating apparatus, and has for its object to provide a device which will render communication more distinct over toll or other lines, which at present operate unsatisfactorily, and comprising means for manually connecting in the repeating apparatus intermediate the terminals of subscribers' or other circuits, at a switchboard, exchange, or other station.

The essence of this invention consists in providing a telephone system provided with a mechanical means located at an intermediate station, capable of manually connecting in or closing a local circuit having included therein the primary of an induction coil, a local battery, and also the variable resistance contacts of an electro-magnetically operated telephone transmitter. Said system being also provided with means for closing simultaneously with the closing of said local circuit by manually operated mechanical connections the two subscribers' lines. Also, said system at the instant of making the above connections, is capable of mechanically connecting into the main line circuit the secondary of said induction coil, and the coils of said electro-magnetically operated transmitter, all as will appear more fully hereinafter.

Referring to the accompanying drawings forming a part of this specification in which the figure is a diagrammatic view of an apparatus made in accordance with my invention, 1 indicates any suitable transmitter, 2 a local battery and 3 the primary of an induction coil 4. 5 represents the secondary of said coil joined as by the wire 6 to the hook lever 7 making circuit with the contact 8 joined to the receiver 9 by the wire 10 and which wire is joined to the spring jack member 11, as shown. The member 11 carries an insulated contact member 12

adapted to make circuit with the spring contact member 13 joined by the wire 14 to the local battery 15 connected by the wire 16 to the contact member 17 making circuit with the contact member 18 of the repeater 19. The said contact member 18 is also joined by the wire 20 to one end of the primary 21 of the induction coil 22, while the other end of said primary is joined by the wire 23 to the contact 12. The jack plug 24 makes contact at 25 with the spring jack member 26 and at 27 with the jack member 11. Said jack plug is also connected as by the wire 28 with the jack plug 29 which makes contact as at 30 with the spring jack member 31 and at the point 32 with the spring jack member 33. The jack member 31 is joined by the wire 34 to the receiver 35 which in turn is joined by the wire 36 to the contact 37 adapted to make circuit with the lever 38 joined by the wire 39 to one end of the secondary 40 of the induction coil 41 and the other end of said secondary is joined by the wire 42 to the jack member 33. The sleeve 30 of the jack plug 29 is also joined by the wire 43 to one end of the coils of the repeater 19, and the other end of said coils is joined by the wire 44 to one end of the secondary 45 of the coil 22. The other end of said secondary is joined by the wire 46 to the sleeve 27 of the jack plug 24.

The operation of my invention is as follows:—Supposing two stations, A and B, are equipped with the usual calling circuits (not shown), and are joined to a switchboard C provided with the jack plugs and spring jacks above described. Upon receiving a call the receivers 9 and 35 are lifted from their hooks thereby closing the circuits at the contacts 7 and 8 and at 37 and 38 respectively. The plugs are inserted in their spring jacks as illustrated in the drawings, and the circuit is made between the contacts 12 and 13, as shown. Should a subscriber now talk into the transmitter, the voice caused currents will leave one end of the secondary 5, traverse the wire 6, contacts 7 and 8, wire 10, receiver 9, spring jack member 11, sleeve 27, wire 46, secondary 45, wire 44, coils of the repeater 19, wire 43, sleeve 30, spring jack member 31, wire 34, receiver 35, wire 36, contact 37, lever 38, wire 39, secondary 40, wire 42, spring jack member 33, contact 32, wire 28, contact 25, spring jack member 26, and

wire 50, back to the other end of secondary 5. These voice caused currents traversing, the receiver 35 of course reproduce speech in said receiver in the usual manner. But these currents also traversing the coils of the repeater 19 will vary the resistance across the contacts 17 and 18, thereby causing the current flowing from the battery 15 through the primary 21 of the coil 22 to be correspondingly varied. These currents corresponding to the voice caused currents traversing the primary 21 will reinforce the voice caused currents traversing the secondary 45, and thereupon will cause the speech heard at the distant station in the receiver 35 to be clearer than would otherwise be the case. On the other hand, should a subscriber at the station B wish to talk to a subscriber at the station A; connections are made at the switchboard C, as shown in the drawings, upon a call being made, and speech is uttered into the transmitter 55 which will cause currents from the battery 56 to traverse the primary 57 of the coil 41. These currents in the coil 57 will cause similar currents to leave one end of the secondary 40 and to traverse the wire 39, contacts 38 and 37, wire 36, receiver 35, wire 34, spring jack 31, sleeve 30, wire 43, coils of the repeater 19, wire 44, secondary 45, wire 46, sleeve 27, spring jack member 11, wire 10, receiver 9, contacts 8 and 7, wire 6, secondary 5, wire 50, spring jack 26, contact 25, wire 28, contact 32, spring jack member 33, and wire 42, back to the other end of said secondary 40. In like manner the passage of these voice caused currents through the coils of the repeater 19 will cause the resistance between the contacts 17 and 18 to be varied, and will cause currents from the battery 15 similar to said voice caused currents to traverse the primary 21 and the contacts 12 and 13, back to said battery 15. These additional currents from the battery 15 in the primary 21 will so re-act upon the currents in the secondary 45 that the speech heard in the receiver 9 will be reinforced and much clearer than would otherwise be the case.

It is evident that those skilled in the art may vary the arrangement of parts without departing from the spirit of my invention, and, therefore, I do not wish to be limited to the above disclosure except as may be required by the claims.

What I claim is:—

1. In a telephone system, the combination

of a plurality of subscribers' stations; an intermediate station; main line circuits between said subscribers' and intermediate stations; a battery and a local circuit including the primary of an induction coil and the variable resistances of an electromagnetically operated telephone transmitter located at said intermediate station; manually operated means also located at said intermediate station adapted to simultaneously and mechanically close said local circuit and the main lines connecting said stations through the secondary of said induction coil and the coils of said transmitter, substantially as described.

2. In a telephone system, the combination of a plurality of subscribers' stations; an intermediate station; main line circuits between said subscribers' and intermediate stations; a battery and a local circuit including the primary of an induction coil and the variable resistances of an electromagnetically operated telephone transmitter located at said intermediate station; manually operated means comprising a spring jack and a local circuit contact also located at said intermediate station adapted to simultaneously and mechanically close said local circuit and the main lines connecting said stations through the secondary of said induction coil and the coils of said transmitter, substantially as described.

3. In a telephone system, the combination of a plurality of subscribers' stations; an intermediate station; main line circuits between said subscribers' and intermediate stations; a battery and a local circuit including the primary of an induction coil and the variable resistances of an electromagnetically operated telephone transmitter located at said intermediate station; manually operated means comprising a plurality of spring jacks and plugs electrically connected, and a local circuit contact associated with each of said jacks also located at said intermediate station adapted to simultaneously and mechanically close said local circuit and the main lines connecting said stations through the secondary of said induction coil and the coils of said transmitter, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

CHARLES ADAMS-RANDALL.

Witnesses:

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FREDERICK B. BLACKMAN.